

PATENT
Atty. Dkt. No. APPM/004215.Y1/PPC/CMP/CKIM
Serial No.: 09/645,690

IN THE CLAIMS:

Please cancel claim 2, 13, 27, and amend claims 1, 3, 5, 12, 14, 16, 26, and 33 by replacing the claims as follows:

1. (Currently Amended) A method of cleaning a polishing pad surface subsequent to chemical-mechanical polishing (CMP) a wafer surface containing copper (Cu) or a Cu-based alloy, the method comprising applying to the polishing pad surface a cleaning composition, wherein the cleaning composition is a solution comprising:

about 0.1 to about 3.0 wt.% of ethylenediamine at least one organic compound containing one or more amine or amide groups;

an acid selected from the group consisting of phosphoric acid, acetic acid and sulfuric acid or a base selected from the group consisting of potassium hydroxide, sodium hydroxide and ammonium hydroxide in an amount such that the composition has a pH of about 5.0 to about 12.0; and

deionized water.

2. (Cancelled).

3. (Currently Amended) The method according to claim 1, wherein the composition is a solution consisting essentially of the ethylenediamine the organic compound, the acid or base, and the deionized water.

4. (Previously Presented) The method according to claim 1, wherein the composition is a solution having a pH of about 8 to about 11.

5. (Currently Amended) The method according to claim 1 [[2]], wherein the ethylenediamine organic compound of the cleaning composition interacts with by-products of the Cu and/or Cu-based alloy generated during CMP to form at least one complex that is soluble in water, and the polishing pad surface is rinsed with water to remove the at least one complex.

PATENT
Atty. Dkt. No. APPM/004215.Y1/PPC/CMP/CKIM
Serial No.: 09/645,690

6. (Original) The method according to claim 4, comprising applying the solution to a rotating polishing pad at a flow rate of about 100 to about 600 ml/min

7. (Original) The method according to claim 6, comprising applying the solution to the polishing pad for about 3 seconds to about 20 seconds after conducting CMP on each of a plurality to wafers having a surface comprising Cu or Cu alloy.

8. (Original) The method according to claim 1 further comprising rinsing the polishing pad surface with water to remove any cleaning solution from the polishing pad surface, after applying the solution and prior to conducting CMP on a subsequent wafer.

9. (Original) The method according to claim 8, comprising rinsing by applying pressurized water to the polishing pad surface for about 2 seconds to about 20 seconds.

10. (Cancelled)

11. (Previously Presented) The method according to claim 1, comprising conditioning the polishing pad surface before, during and after applying the cleaning solution.

12. (Currently Amended) A method comprising:

(a) conducting chemical-mechanical polishing (CMP) on a first wafer surface of a first wafer containing copper (Cu) or a Cu-based alloy on a surface of a polishing pad;

(b) removing the first wafer from the pad;

(c) applying to the polishing pad surface a cleaning composition, wherein the cleaning composition is a solution comprising:

~~about 0.1 to about 3.0 wt.% of ethylenediamine at least one organic compound containing one or more amine or amide groups;~~

~~an acid selected from the group consisting of phosphoric acid, acetic acid and sulfuric acid or a base selected from the group consisting of potassium hydroxide,~~

PATENT
Atty. Dkt. No. APPM/004215.Y1/PPC/CMP/CKIM
Serial No.: 09/645,890

sodium hydroxide and ammonium hydroxide in an amount such that the composition has a pH of about 5.0 to about 12.0; and

deionized water;

(d) rinsing the polishing pad surface with water to remove any cleaning composition on the polishing surface;

(e) conducting CMP on a second wafer; and then

(f) repeating (b) through (e).

13. (Cancelled).

14. (Currently Amended) The method according to claim 12, wherein the composition is a solution consisting essentially of the ethylenediamine-organic compound, the acid or base, and the deionized water.

15. (Previously Presented) The method according to claim 12, wherein the composition is a solution having a pH of about 8 to about 11.

16. (Currently Amended) The method according to claim 12, wherein the ethylenediamine-organic compound of the cleaning composition interacts with by-products of the Cu and/or Cu-based alloy generated during CMP to form at least one complex that is soluble in water, and the at least one complex is removed during rinsing.

17. (Original) The method according to claim 15, comprising applying the solution to a rotating polishing pad at a flow rate of about 100 to about 600 ml/min.

18. (Original) The method according to claim 17, comprising applying the composition to the rotating polishing pad for about 3 seconds to about 20 seconds.

19-25. (Cancelled)

PATENT
Atty. Dkt. No. APPM/004215.Y1/PPC/CMP/CKIM
Serial No.: 09/845,690

26. (Currently Amended) A method of cleaning a surface of a polishing pad, comprising:

conducting chemical-mechanical polishing (CMP) on a first wafer on the surface of the polishing pad;

removing the first wafer from the polishing pad;

applying to the polishing pad surface a cleaning composition, wherein the cleaning composition is a solution comprising further comprises:

about 0.1 to about 3.0 wt.% of ethylenediamine ~~at least one organic compound containing one or more amine or amide groups~~;

an acid selected from the group consisting of phosphoric acid, acetic acid and sulfuric acid or a base selected from the group consisting of potassium hydroxide, sodium hydroxide and ammonium hydroxide in an amount such that the composition has a pH of about 5.0 to about 12.0; and

deionized water; and

cleaning the polishing pad surface with the cleaning composition.

27. (Cancelled).

28. (Previously Presented) The method according to claim 26, wherein the cleaning composition is a solution having a pH of about 8 to about 11.

29. (Previously Presented) The method according to claim 26, wherein the cleaning composition is applied to a rotating polishing pad at a flow rate of about 100 ml/min to about 600 ml/min.

30. (Previously Presented) The method according to claim 26, wherein the cleaning composition is applied to a rotating polishing pad for about 3 seconds to about 20 seconds.

31. (Previously Presented) The method according to claim 26, further comprising

PATENT
Atty. Dkt. No. APPM/004215.Y1/PPC/CMP/CKIM
Serial No.: 09/645,680

rinsing the polishing pad surface with water to remove any cleaning composition on the polishing surface.

32. (Cancelled)

33. (Currently Amended) The method according to claim 1 [[2]], further comprising:

rinsing the polishing pad surface with water.